

1. Find the y -intercept of the tangent line to the curve $y = x^3$ at the point $(2, 8)$.

2a Let $f(x) = \sqrt{3x}$. Find $f'(3)$.

2b Given $f(3) = 5$, $f'(3) = 1.1$, $g(3) = -4$ and $g'(3) = 0.7$ find the value of $(f \cdot g)'(3)$.

- 3 A spherical balloon is being inflated in such a fashion that its radius increases at a rate of 1 cm/s. In cm^3/s , how fast is the volume increasing 3 seconds after inflation starts?

4a. Find the value of the limit $\lim_{x \rightarrow 0} \frac{\cos x - 1}{2x}$.

4b. Let $f(x) = x \tan x$. Find $f'(\pi/4)$.

5a. Let $f(x) = (x + 1)^4$. Find $f'(1)$.

5b. Let $f(x) = \sin^2(2x)$. Find $f'(\pi/6)$.

5c. If $f(x) = 4\sqrt{x - \sqrt{x}}$, find the value of $f'(4)$.

6a. If $x^2 + xy + y^2 = 7$, find the value of dy/dx at the point $(1, 2)$.

6b. Find the slope of the tangent to the curve $xy^2 + x^2y = 2$ at the point $(1, 1)$.

7. Let $y = \frac{x}{(x+1)}$. Find $f''(0)$.

8.

A ladder 10 feet long is leaning against a wall, with the foot of the ladder 8 feet away from the wall. If the foot of the ladder is being pulled away from the wall at 3 feet per second, how fast in feet per second is the top of the ladder sliding down the wall?